Energy saving potentials – A case study on the Danish building stock

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Energy-saving potential – a case study of the Danish building stock

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A study of data extracted from the building Energy Performance Certification scheme data-base reveals a great potential for energy saving in existing buildings. A building energy labelling became mandatory in Denmark in 1997. Data were used to set up an energy balance for the entire Danish building stock, divided into different sectors and periods of construction. The energy-saving potential is high even considering years of campaigns promoting energy saving, the energy-saving subsidies given and building-energy-performance audits, and the fact that in Denmark the energy consumption has not increased since 1980. The general perception is that much has been achieved and generally house owners claim that they are conscious of their energy consumption, but that further investment in energy-saving measures cannot pay for itself.

This paper analyses the current energy status of the existing building stock from a scientific point of view and quantifies the national energy-saving potential by extracting data from the Energy Performance Certification scheme and combining it with data from other sources. In an analysis, where only 50% of the least energy-efficient constructions are improved, this potential is about 30% of the national energy consumption for space heating and 10% of the CO2 emission that can be related to housing. Furthermore the method is used to investigate possible paths that Denmark may follow in order to become CO2 neutral by 2050 and how buildings can supply their share of the required savings. Identification of how to act now in order to reach the goal by 2050 by means of an acceptable investment rate for building upgrading is discussed.

The paper also discusses how knowledge recorded in the energy performance certificates can be used through different kinds of actions, ranging from promoting the Energy Performance Certification scheme to definitions of pilot projects addressing different target groups.